



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/817,821	03/26/2001	Keith Hall	SMX 3071.1 (99-22R1)	7846

321 7590 08/14/2003

SENNIGER POWERS LEAVITT AND ROEDEL
ONE METROPOLITAN SQUARE
16TH FLOOR
ST LOUIS, MO 63102

EXAMINER

TRAN, MY CHAU T

ART UNIT	PAPER NUMBER
----------	--------------

1639

DATE MAILED: 08/14/2003

10

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/817,821

Applicant(s)

HALL ET AL.

Examiner

My-Chau T. Tran

Art Unit

1639

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-72 is/are pending in the application.
- 4a) Of the above claim(s) 7,8,20,23-39,42-46,50,51,53 and 59-68 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,9-19,21,22,40,41,47-49,52,54-58 and 69-72 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Art Unit: 1639

DETAILED ACTION

1. Applicant's amendment filed 1/31/03 in Paper No. 7 is acknowledged and entered.

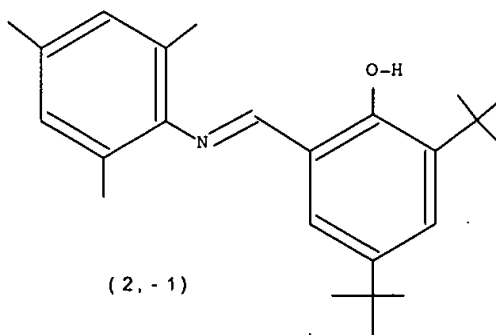
Claims 73-89 are canceled. Claims 1-72 are pending.

Election/Restrictions

2. Applicant's election without traverse of Group I (Claims 1-72) in Paper No. 7 is acknowledged.

3. Applicant's election without traverse of species in Paper No. 7 is acknowledged. The species selection are as follows:

- a. Species 1 (Type of soluble metal precursor): Formula $MR_n = Hf(CH_2Ph)_4$
- b. Species 2 (Type of coordination number for metal-binding ligand): 2
- c. Species 3 (Type of Charge for metal-binding ligand): -1
- d. Species 4 (Type of metal-binding ligand):



- e. Species 5 (Type of activator): $PhNMe_2HB(C_6F_5)_4$
- f. Species 6 (Type of property of interest to be screened): Chemical property

Art Unit: 1639

- g. Species 7 (Type of screening method): Gravimetric measurement of the product yield
- h. Species 8 (Number of Ligands in the array): 8
- i. Species 9 (Type of deprotonating agent): BuLi

Accordingly, the claims that read on the elected species include 1-6, 9-19, 21, 22, 40, 41, 47-49, 52, 54-58, and 69-72.

4. Claims 7-8, 20, 23-39, 42-46, 50-51, 53, and 59-68 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 7.

5. Applicant's election without traverse of species in Paper No. 9 is acknowledged. The species selection are as follows:

- a) The species of polymerization product: see structure of species 12 in Paper No. 9, wherein the species of polymerization monomer is polyethylene homopolymer and the species a meta-ligand composition is the structure of species 11 in Paper No. 9.

6. Claims 1-6, 9-19, 21, 22, 40, 41, 47-49, 52, 54-58, and 69-72 are treated on the merit in this Office Action.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

8. Claims 1, 3, 54-57, and 72 are rejected under 35 U.S.C. 102(b) as being anticipated by President and Fellows of Harvard College (WO 98/12,156) (Note: it is refers as ‘Harvard College’).

Harvard College et al. disclosed methods and compositions, i.e. synthetic libraries of binding moieties, for identifying compounds, which bind to a metal atom (pg. 3, lines 32-36 to pg. 4, lines 1-14; fig. 1). The method comprises (a) chemically synthesizing a variegated library of potential binding moieties ("PBMs") (refers to claim 1 step (a) and (b)), and (b) screening the library of PBMs to isolate/identify those members that bind to a metal atom (refers to claim 1

Art Unit: 1639

step (b)). The library of PBM comprises two different classes of monomeric chemical components that is the metal binding group (metal ligand composition) and the turn element group (polymerization monomer) (pg. 17, lines 7-18). The PBM library can be synthesized in solution, and by the use of deconvolution techniques, or synthesis in multiple reaction vessels (refer to claims 3 and 72) (pg. 39, lines 34-36). The method uses of techniques such as encoding, spatially addressing, mass spectroscopy and/or deconvolution, combinatorial libraries of PBMs can be synthesized by batch processes and, importantly, the molecular identity of individual members of the library can be ascertained in a screening format (pg. 2, lines 3-5; pg. 33-39). Therefore the method of Harvard College et al. anticipates the presently claim method.

9. Claims 1-6, 10-19, 22, , 47-49, 52, 54-57, and 72 are rejected under 35 U.S.C. 102(e) as being anticipated by Weinberg et al. (US Patent 6,030,917).

The applied reference has common inventors (e.g. Johannes A.M. van Beek and Vince Murphy) with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Weinberg et al. disclosed a method '[for the combinatorial synthesis, screening and characterization of large arrays or libraries of diverse supported and unsupported ligands, catalysts and organometallic compounds]' (col. 3, lines 29-35). The '[m]ethod comprising: (a) synthesizing a spatially segregated array of ligands; (b) delivering a suitable metal precursor to

Art Unit: 1639

each element of the array of ligands to create an array of metal-ligand compounds; (c) optionally activating the array of metal-ligand compounds with a suitable cocatalyst; (d) optionally modifying the array of metal-ligand compounds with a third component; and (e) screening the array of metal-ligand compounds for a useful property using a parallel or rapid serial screening technique selected from the group consisting of optical imaging, optical spectroscopy, mass spectrometry, chromatography, acoustic imaging, acoustic spectroscopy, infrared imaging and infrared spectroscopy' (col. 3, lines 36-54). The 'chemical synthesis steps can be conducted using solid-phase, solution-phase or a combination of solid-phase and solution-phase synthetic techniques' (col. 10, lines 66-67 to col. 11, lines 1-4) (refers to claim 3). 'The ligands have a coordination number, which is independently selected from the group consisting of 1, 2, 3 and 4' (col. 10, lines 35-47) (refers to claims 16-19). 'These preferred ligands have a charge, which is independently selected from the group consisting of 0, -1, -2, -3 and -4. Certain preferred ligands have a charge, which is greater than their coordination number'. The activator is $[\text{PhNMe}_2\text{H}][\text{B}(\text{C}_6\text{F}_5)_4]$ (refers to the elected activator species). Therefore the method of Weinberg et al. anticipates the presently claimed method.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1639

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 1-6, 9-19, 21, 22, 40, 41, 47-49, 52, 54-58, 69, and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over President and Fellows of Harvard College (WO 98/12,156) (Note: refers as 'Harvard College') and Fujita et al. (US Patent 6,309,997 B1).

Harvard College et al. disclosed methods and compositions, i.e. synthetic libraries of binding moieties, for identifying compounds, which bind to a metal atom (pg. 3, lines 32-36 to pg. 4, lines 1-14; fig. 1). The method comprises (a) chemically synthesizing a variegated library of potential binding moieties ("PBMs") (refers to claim 1 step (a) and (b)), and (b) screening the library of PBMs to isolate/identify those members that bind to a metal atom (refers to claim 1 step (b)). The library of PBM comprises two different classes of monomeric chemical components that is the metal binding group (metal ligand composition) and the turn element group (polymerization monomer) (pg. 17, lines 7-18). The PBM library can be synthesized in solution, and by the use of deconvolution techniques, or synthesis in multiple reaction vessels (refer to claims 3 and 72) (pg. 39, lines 34-36). The method uses of techniques such as encoding, spatially addressing, mass spectroscopy and/or deconvolution, combinatorial libraries of PBMs

Art Unit: 1639

can be synthesized by batch processes and, importantly, the molecular identity of individual members of the library can be ascertained in a screening format (pg. 2, lines 3-5; pg. 33-39).

The method of Harvard College et al. does not expressly disclose that the “elected” species of polymerization product (see species 12 in Paper No. 9) wherein the metal is Hf(IV) and the polymerization monomer is ethylene.

Fujita et al. disclose an olefin polymerization catalyst exhibiting excellent polymerization activities, a process for olefin polymerization using the catalyst, a novel transition metal compound useful for the catalyst, and an α -olefin/conjugated diene copolymer having specific properties (Abstract; col. 2, lines 40-43). The metal include and the α -olefin/conjugated diene copolymer includes ethylene (col. 19, lines 45-63; col. 141, lines 59-67 to col. 142, lines 1-5). Fujita et al. further disclosed the method making the metal compound (col. 141, lines 1-56) and the olefin polymerization using the metal compound (col. 215, lines 5-67).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the “elected” species of polymerization product (see species 12 in Paper No. 9) wherein the metal is Hf(IV) and the polymerization monomer is ethylene as taught by Fujita et al. in the method of Harvard College et al. One of ordinary skill in the art would have been motivated to include the “elected” species of polymerization product (see species 12 in Paper No. 9) wherein the metal is Hf(IV) and the polymerization monomer is ethylene in the method of Harvard College et al. for the advantage of providing an olefin polymerization catalyst having excellent olefin polymerization activities since both Harvard College et al. and Fujita et al. disclose method of making metal ligand composition (Harvard College: pg. 17, lines 7-18; Fujita: col. 141, lines 1-56).

Art Unit: 1639

13. Claims 70-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over President and Fellows of Harvard College (WO 98/12,156) (Note: refers as 'Harvard College') and Fujita et al. (US Patent 6,309,997 B1) as applied to claims 1-6, 9-19, 21, 22, 40, 41, 47-49, 52, 54-58, 69, and 72 above, and further in view of Murata et al. (US Patent 5,892,075).

Harvard College et al. disclosed methods and compositions, i.e. synthetic libraries of binding moieties, for identifying compounds, which bind to a metal atom (pg. 3, lines 32-36 to pg. 4, lines 1-14; fig. 1). The method comprises (a) chemically synthesizing a variegated library of potential binding moieties ("PBMs") (refers to claim 1 step (a) and (b)), and (b) screening the library of PBMs to isolate/identify those members that bind to a metal atom (refers to claim 1 step (b)). The library of PBM comprises two different classes of monomeric chemical components that is the metal binding group (metal ligand composition) and the turn element group (polymerization monomer) (pg. 17, lines 7-18). The PBM library can be synthesized in solution, and by the use of deconvolution techniques, or synthesis in multiple reaction vessels (refer to claims 3 and 72) (pg. 39, lines 34-36). The method uses of techniques such as encoding, spatially addressing, mass spectroscopy and/or deconvolution, combinatorial libraries of PBMs can be synthesized by batch processes and, importantly, the molecular identity of individual members of the library can be ascertained in a screening format (pg. 2, lines 3-5; pg. 33-39).

Fujita et al. disclose an olefin polymerization catalyst exhibiting excellent polymerization activities, a process for olefin polymerization using the catalyst, a novel transition metal compound useful for the catalyst, and an α -olefin/conjugated diene copolymer having specific properties (Abstract; col. 2, lines 40-43). The metal include and the α -olefin/conjugated diene copolymer includes ethylene (col. 19, lines 45-63; col. 141, lines 59-67 to col. 142, lines 1-5).

Art Unit: 1639

Fujita et al. further disclosed the method making the metal compound (col. 141, lines 1-56) and the olefin polymerization using the metal compound (col. 215, lines 5-67).

The method of Harvard College et al. and Fujita et al. does not expressly disclose that the addition of a deprotonating agent in the method of synthesizing the metal ligand compound and the deprotonating agent is BuLi.

Murata et al. disclose a process for synthesizing metallocene compounds (Abstract; col. 3, lines 7-14). The metal includes Hf(IV) (col. 10, lines 23-38). The synthetic method of the metal compound comprise of the addition of the deprotonating agent, which is n-BuLi (col. 11, lines 31-40).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the addition of a deprotonating agent in the method of synthesizing the metal ligand compound and the deprotonating agent is BuLi as taught by Murata et al. in the method of Harvard College et al. and Fujita et al. One of ordinary skill in the art would have been motivated to include the addition of a deprotonating agent in the method of synthesizing the metal ligand compound and the deprotonating agent is BuLi in the method of Harvard College et al. and Fujita et al. for the advantage of providing an efficient synthesis of metallocene compounds (Murata: col. 5, lines 48-56) since Harvard College et al., Fujita et al., and Murata et al. disclose method of making metal ligand composition (Harvard College: pg. 17, lines 7-18; Fujita: col. 141, lines 1-56; Murata: col. 3, lines 7-14).

Art Unit: 1639

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to My-Chau T. Tran whose telephone number is 703-305-6999. The examiner is on ***Increased Flex Schedule*** and can normally be reached on Monday: 8:00-2:30; Tuesday-Thursday: 7:30-5:00; Friday: 8:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew J. Wang can be reached on 703-306-3217. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9307 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1123.


PADMA SHRI PONNALURI
PRIMARY EXAMINER

mct
August 10, 2003